Exhibit 1

THE ECONOMIC IMPACT OF PROVIDING SERVICE TO MULTIPLE LOCAL BROADCAST STATIONS WITHIN A SINGLE GEOGRAPHIC MARKET

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EXECUTIVE SUMMARY

In this paper I analyze one of the major components of the Federal Communications Commission's (FCC's) media ownership rules that are currently being reviewed by the Commission in its 2002 Biennial Regulatory Review. I examine the economic case for continuing the Commission's "duopoly" rules for television broadcast stations and provide empirical evidence of the economic impact of multi-station service provision arrangements. Using a unique dataset provided by one large multiple-station service provider, Sinclair Broadcast Group, Inc. (Sinclair), I analyze empirically the effect of ownership or local management arrangements of more than one station within a geographic market on local television advertising rates.

In certain designated market areas (DMAs), Sinclair owns a single broadcast station, whereas in other DMAs, Sinclair either owns two stations or owns one station and provides services to a second station. Also, there are four DMAs in which Sinclair provides service pursuant to a local marketing agreement to two of the "Big-4" network affiliates—an arrangement that the Commission's current rules effectively prohibit altogether in the vast majority of DMAs.[1] Using proprietary data from Sinclair on station-specific advertising revenues, station viewer ratings, and DMA characteristics, I estimate the determinants of station revenues across DMAs. This analysis allows me to test for the effect that Sinclair's service

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1. The Big-4 networks are ABC, CBS, NBC, and Fox. These station affiliates are the four highest-rated stations in all but one of Sinclair's DMAs—that one DMA being St. Louis. This paper analyzes the economic impact of duopoly arrangements with Big-4 affiliated stations. I note, however, that the FCC's duopoly rules forbid the ownership and operation of two of the four *top-rated* stations in a DMA, not two of the Big-4 stations in a DMA. *See* Notice of Proposed Rulemaking, in the Matter of the 2002 Biennial Regulatory Review–Review of the Commission's Broadcast Ownership Rules and Other Rules Adopted Pursuant to Section 202 of the

provision to multiple stations, or multiple Big-4 stations, within a DMA has on its local advertising revenues.

Using conventional econometric techniques, I find no evidence that a multi-station arrangement within a single DMA allows the provider to increase its advertising rates and, therefore, its revenues from those stations. Moreover, I find statistically significant evidence of an association between duopoly arrangements that include two of the Big-4 stations in a DMA and reductions in station revenues. The results suggest that the goal of these arrangements is to improve operating efficiency through cost reduction, rather than to increase advertising revenues or prices.

Indeed, the results in this paper show that multiple television station service arrangements within a single DMA have not allowed Sinclair to exert market power in local advertising markets. Nor have, multi "Big-4" service arrangements permitted Sinclair to exert such market power. The Commission should carefully consider how it regulates service provision for local broadcast television. By maintaining "remaining voices" standards, and by blindly stipulating that one entity cannot own two of the top four stations in a DMA, the FCC would adopt standards that are not consistent with conventional antitrust analysis of consumer harm.

This report was prepared for Sinclair Broadcast Group. The opinions expressed here are mine alone, and do not reflect those of the Brookings Institution, which takes no institutional position on specific regulatory matters.

Telecommunications Act of 1996, No. 17 F.C.C. Rcd. 18,503, 18,505-6 at ¶ 6 [hereinafter 2002 Biennial Review], citing 47 C.F.R. § 73.3555(b).

INTRODUCTION

The FCC's current media ownership rules require that eight independently owned and operated full-power stations must remain in a DMA if a single entity is to be permitted to own or otherwise provide service to multiple stations within that DMA.[2] Those regulations further prohibit such ownership or provision of service to affiliates of two of the four top rated television networks within a DMA.[3] Neither standard is grounded in economic analysis that demonstrates that such limitations are required to protect consumers from economic harm.

My report attempts to fill the evidentiary void in this area of research by first developing a framework through which to estimate the effect of potential market power in local television broadcasting. I then provide an empirical analysis based on that framework, using a unique dataset provided to me by the Sinclair Group. This analysis estimates the effect (if any) that the existence of service arrangements for multiple stations within a DMA, or multiple "Big-4" network stations within a DMA, has on station revenues for a specific service provider.

My report is organized as follows: Section I contains a review of the regulations relevant to local television service providers in the United States. Section II explains the optimization problem for the profit-maximizing television service provider. The Lerner Index of market power is then explained and applied to local television advertising to explain how one would attempt to measure any potential effect that the provision of service to multiple stations would have on market power.

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2. An entity could alternately satisfy the FCC's regulations if the Grade B contours of the broadcast stations do not overlap. *See* 2002 Biennial Review, *supra* note 1, at ¶ 6, citing 47 C.F.R. § 73.3555(b). The Grade B contour is the invisible contour around the station's antenna within which Grade B service—that is, a reliable level of undisturbed service—is transmitted. For stations operating in broadcast channels 14 to 69, the Grade B Contour has required field-strength of 64 decibels above one micro-volt per meter. *See* FCC Radio Broadcast Services, 47 C.F.R. § 73.683 (2001).

3. *See* 2002 Biennial Review, *supra* note 1, at ¶ 6, citing 47 C.F.R. § 73.3555(b).

In Section III, I discuss the statistical model that I use to analyze the effect, if any, that the provision of service to multiple stations within a DMA has on market power. I apply this model to a dataset of station revenues and market characteristics for Sinclair, a service provider with operations in numerous DMAs. I find no evidence that the provision of service to multiple stations within a DMA has increased Sinclair's market power in those areas. On the contrary, I find evidence that the provision of service to multiple Big-4 stations within a DMA has resulted in *lower* advertising revenues for those stations. This result indicates that the FCC's regulations of the local broadcast industry are overly restrictive.

Finally, I review the relevant antitrust framework that a regulator should use in scrutinizing a proposed consolidation among local broadcast television stations. That framework is outlined in the Department of Justice's (DOJ's) *Merger Guidelines*, whose provisions I apply to the local television broadcast industry.

I. U.S. REGULATION OF THE PROVISION OF SERVICES TO MULTIPLE TELEVISION STATIONS IN A SINGLE DMA

Both the FCC and the DOJ regulate the ownership or control of television stations. The FCC's regulations apply to broadcast television markets and are applied identically to all DMAs. The DOJ's authority derives from its enforcement of antitrust laws. Its interest in the control of television station ownership or control is therefore part of its general obligation to police horizontal mergers that would result in consumer harm.

A. The Federal Communications Commission

The FCC's current local television ownership rules allows an entity to own two stations within the same DMA if the Grade B contours of those stations do not overlap.[4] Alternatively, one entity may own two stations within a common DMA if at least one of those stations is not among the four highest-ranked stations in that DMA, and if at least eight independently owned and operated full-power stations remain in that DMA.[5]

The Commission's local TV ownership rules appear to be based on the notion that other television broadcasters are the only other relevant media "voices" in the local market. On the other hand, the current rules governing the cross-ownership of radio and TV stations within a single market indicate that the Commission considers daily newspapers, radio stations, and cable operators as voices in the same market.[6] The U.S. Court of Appeals for the D.C. Circuit noted the inconsistency in the FCC's definitions of local market media voices, and remanded to the Commission.[7] The FCC has thus commenced a review of its rules that govern the ownership of media as part of its 2002 biennial review.[8]

The Commission has stated that the effect of television ownership concentration on the diversity of viewpoints expressed through local broadcast television is an important factor in the regulation of broadcast television.[9] However, the Commission has also recognized that the

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4. *Id.*
5. *Id.*
6. *See* 47 C.F.R. § 73.3555(c).
7. *See Sinclair Broadcast Group Inc. v. FCC,* 284 F.3d. 148 (D.C. Cir. 2002) at 162 (addressing the local TV ownership rule).
8. *See* 2002 Biennial Review, *supra* note 1, at 18,505-6 ¶ 6.
9. *See id.* at 18,529 ¶ 78.

proliferation of cable and satellite television may substantially dilute any effect of broadcast television ownership on program diversity.[10]

The Commission has acknowledged that local television advertising competes in a general market for local advertising,[11] and it has sought to determine the exact nature of this competition. That is, the Commission has sought to determine if local broadcast television advertising is a part of the larger market for local advertising, or if it is its own separate market.[12] Thus, as part of its 2002 biennial review, the Commission has asked for comments on the effect that local TV ownership has on competition for television advertising for local businesses.[13]

B. The U.S. Department of Justice

In its enforcement of the antitrust laws, the DOJ analyzes the effect of mergers and acquisitions on local competition. Included in this analysis are those mergers or acquisitions that result in a single entity's ownership of multiple television stations within a single local market. For example, in April 2001 the DOJ allowed The News Corporation to proceed with its planned acquisition of Chris-Craft Industries, provided that The News Corporation sold a broadcast television station in the Salt Lake City DMA.[14] Its analysis concluded that, absent the divestiture of one of the stations in the Salt Lake City DMA, the combined entity would have controlled 40 percent of the revenues from spot advertising in what the DOJ determined to be the relevant market.[15]

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10. *Id.* at 18,531 ¶ 83.
11. *Id.* at 18,532-3 ¶ 87.
12. *Id.*
13. *Id.* at 18,532 ¶ 86.
14. Competitive Impact Statement, United States v. The News Corp. Limited, et. al., Civ. Act. No. 1:01cv00771 (D.D.C. filed May 14, 2001) (submitted by the U.S. Department of Justice).
15. *Id.*

II. THE SERVICE PROVIDER'S PROFIT MAXIMIZATION DECISION

To estimate the effect that the provision of service to multiple stations or multiple Big-4 stations in an area has on market power, one must first understand how a service provider determines the number of advertising minutes to offer and the price of those minutes. The structure of this problem—that is, the decision broadcaster's "profit maximization problem"—will differ somewhat between the long-term and the short-term. However, an analysis of this problem yields a testable result that will determine if service provision to multiple stations enhances market power. In the following section, I discuss the service provider's profit maximization problem in elementary terms. A more rigorous treatment of this problem is presented in Appendix III.

A. The Profit Maximization Problem

In a given time period, a rational broadcaster chooses the quantity of viewer minutes of advertising on the station(s) for which it provides services to maximize its profits.[16] This choice involves the selection of programming and the offering of advertising minutes in that programming. For a given choice in programming, the marginal cost of placing another thirty-second commercial on the air should be negligible. Put differently, if a service provider's schedule is fixed, the cost of supplying unused advertising minutes in that programming is essentially zero.

A broadcaster may, however, choose to change its programming in time period t to offer a different quantity of viewer minutes of advertising. These programming changes will add incremental costs to the provision of additional advertising minutes and, as a result, the

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16. The quantity of advertising slots is fixed, because the broadcaster's material consist largely of programs made to run within half-hour, or hour time slots, and allow for a set amount of advertising.

broadcaster must internalize these incremental costs when deciding how many viewer minutes of advertising to offer. The typical service provider would face these circumstances in the long-term, because its programming schedule is likely to be fixed during the short-term.

a. The Long-Term

The profit-maximizing broadcaster chooses an advertising price such that marginal costs are equated with marginal revenues.[17] Put differently, the broadcaster maximizes its profits when the last minute of advertising sold yields revenues that equal the costs of providing that last minute of airtime.

Economists consider market power to be the ability of the producer to price its goods above marginal costs. As the difference between price and marginal costs rises, the firm's market power increases. The Lerner Index of market (monopoly) power measures the ability of a firm to set price above marginal costs, which is inversely related to the elasticity of demand for that firm's product.[18] The more inelastic is the demand curve for a firm's product—that is, the less sensitive advertisers are to increases in the price of a service provider's advertising slots—the greater is that provider's market power.

Consolidation among service providers in a particular market would increase market power if the demand for a station's advertising slots became less sensitive to price as a result of the consolidation. If by providing service to multiple stations within a market the demand for those stations' advertising slots became more price-inelastic, the service provider's ability to price above marginal cost would increase. One can derive a testable hypothesis from this

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17. *See, e.g.*, ROBERT S. PINDYCK & DANIEL L. RUBINFELD, MICROECONOMICS 254 (Prentice Hall 4th ed. 1998).

18. *See* Abba Ptachya Lerner, *The Concept of Monopoly and the Measurement of Monopoly Power*, 1 REV. ECON. STUD. 157, 157-75 (1934).

principle. After controlling for other factors that affect the demand for a station's advertising slots (such as number of viewers in the market), one can estimate the relationship between price and market demographics (such as the total number of viewers, their incomes, and their ages) for a group of stations. If this relationship is different in markets where an entity provides service to multiple stations or multiple Big-4 stations, one could determine if this difference is due to economies of multiple station operation or to increased market power provided by such operations.

b. The Short-Term

In the short-term, programming decisions have been made, and the quantity of viewer minutes of advertising available is more rigid than in the long-term. The broadcaster has a maximum number of viewer minutes that it can sell. It will set price according to the rule that *marginal* costs are equated with *marginal* advertising revenues. However, in the short run the station's incremental costs are negligible. With zero marginal costs, the broadcaster's profit maximization rule simply requires it to set marginal revenues equal to zero. In essence, this means that the service provider's objective is to maximize its advertising revenues in the short-term (see Appendix III), a result that requires it to set its price where the demand for its product has unitary elasticity. At this point, a one percent increase in the advertising rate leads to a one percent decrease in the quantity of advertising minutes demanded.

If the provision of services to multiple stations in a market creates market power in the local advertising market, it does so by making the demand for advertising more inelastic at any given price. In the short-term the broadcaster sets its advertising price at that point where the demand for its advertising has unitary elasticity. Consequently, the broadcaster would react to

such a decrease in the price sensitivity for its product by raising its advertising rates, which would in turn cause its revenues to rise.

III. EMPIRICAL ANALYSIS OF THE EFFECT ON ADVERTISING REVENUES FROM SERVICE PROVISION TO MULTIPLE BROADCAST STATIONS IN A DMA

The effect of a combination of two or more broadcast stations in a DMA on advertising rates depends on the geographic scope of the market, the number of competing broadcasters, and the degree to which other media compete for advertising in the relevant geographic market. An empirical analysis is required to determine if service provision to multiple stations in a single DMA allows a station operator to exert power in the market for local advertising revenues.

The advertising revenues that a station receives for its advertising slots will depend on the size and demographics of the viewing audience. For example, some advertisers prefer to reach younger viewers, and are therefore willing to pay a premium to advertise to those viewers.[19] In addition to age, the incomes of viewers and any number of other demographic variables could affect the advertising rate that a broadcaster can charge. By controlling for the effect that these demographics have on advertising rates, one may analyze a broadcaster's ability to exert market power through service provision to multiple stations within a single DMA. If a multiple-station arrangement in a DMA does indeed give a firm market power in the advertising market, the firm could profitably increase its prices and thereby increase its advertising revenues. On the other hand, if sufficient efficiencies were created as a result of the merger, prices in the market would fall, and output would increase the long run.

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19. *See, e.g.*, Jonathan Dee, *The Myth of '18 to 34'*, N.Y. TIMES MAGAZINE, Oct. 13, 2002, at 58.

A. Econometric Model

To estimate the effect that service provision to multiple stations has on advertising revenues, *TR*, I estimate the determinants of a "log-linear" revenue function for a particular station.[20] Using *i* as an index for the particular station in question, I define revenues according to Equation (1):

(1) $$\log(q_i * p_i) = \log(TR_i) = a_0 + a_1 n_i + a_2 y_i + a_3 cable + kD_i + a_4 o_i + e_i .$$

The variables in Equation (1) are defined as:

q_i = total viewer minutes of advertising (in thousands) for station *i*.

p_i = price per thousand viewers for a single advertising minute.

n_i = thousands of station viewers (of a certain age group) during the average viewing minute

y_i = per capita income within that DMA.

$cable_i$ = proportion of households in station *i*'s DMA that subscribe to cable.

D_i = a vector of variables of the percent of persons in the DMA of various racial backgrounds.

o_i = 1 if the broadcaster provides service to another station within that DMA, 0 otherwise

e_i = a random error term.

The letters $a_1, \ldots, a_4$ are the regression parameters that we wish to estimate, and k denotes a vector of regression parameters that are specific to variables that capture the racial characteristics within the DMA. If a regression parameter is positive and "statistically significant," the impact

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20. Alternatively, I could estimate a model with advertising price, expressed as cost per rating point or cost per thousand viewers, as the dependent variable, and DMA households as the key independent variable. I would then control for service provision to multiple-stations or multiple Big-4 stations with a dummy variable. As I mention below, the results from the estimation of such a model are nearly identical

of the variable for that parameter on advertising revenues is positive and was estimated with statistical accuracy.

In equation (1), the number of viewers during an average viewing minute, *n,* should be positively related to the total revenue that station *i* can derive from advertisers. The regression parameter a_1 should therefore be positive. Hence, the service provider should be able to request higher prices for its advertising slots as audiences increase.

The regression parameter a_2 should also be positive, because higher average income in a DMA should reflect a more attractive market for retail sales. The percentage of homes in the DMA that subscribe to cable reflects the intensity of household interest in television and the willingness to spend discretionary income; therefore the parameter a_3 should be positive. I have no prior expectation on the signs of the parameters within the vector *k*, which contains regression coefficients for the racial demographic variables.

Finally, and most importantly, if the parameter a_4 is positive in sign, the ownership or operation of multiple stations in a single DMA would appear to add to a broadcaster's ability to exercise market power. However, if the sign on a_4 is negative, then one could conclude that the ownership of multiple stations in a DMA improves the efficiency of such operations resulting in lower revenues in equilibrium. Thus, the sign on the parameter a_4 is relevant to the Commission's policy towards ownership rules for local broadcast television. A positive and statistically significant a_4 would indicate that the FCC's current policy of limiting the provision of service to multiple stations in a single DMA, although not grounded in economic analysis, has potential merit. But a negative sign on a_4 would indicate that the FCC's rules are overly restrictive because they may block consolidations that result in cost reducing efficiencies that benefit consumers.

B. Data

The data that I use for this analysis are drawn from the set of television stations for which Sinclair is a service provider. These services could result from either ownership and operation of the station, or from an alternate service provision arrangement.[21] The dataset represents fifty-eight stations in thirty-eight DMAs for which Sinclair has been a service provider since January 2002.[22] Sinclair provided its price data measured in both cost per thousand viewers during an advertising minute (CPT) and cost per rating point per advertising minute (CPP). The price data and viewer data reflect the three most recent sweeps (November 2001, February 2002, and May 2002). I merged these data with DMA-specific demographics for the year 2001, which I extracted from BIA Financial Network's 2002 Television Report,[23] Nielsen Media Research,[24] and Standard Rate Data Service.[25] Table 1 contains summary statistics for the publicly available data in my analysis. Appendix I lists the relevant DMAs for this analysis.

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21. Other arrangements are those where the station's license holder is another party. Under one arrangement, the licensee owns the station, but another party provides programming subject to the ultimate authority of the licensee to approve or disapprove the programming. Such an arrangement is referred to as a local marketing agreement (LMA). Another form of arrangement is the joint sales agreement (JSA), where a party other than the licensee sells the commercial inventory, but does not have input into the content provision of that station.

22. I excluded WFGX in Pensacola FL because it is a small local station with almost no coverage, and therefore it has no ratings data. I treated WICD and WICS in Springfield IL as a single station, because WICD is a satellite of WICS. Those stations are both NBC affiliates, and exist to increase the broadcast range of that programming within the Springfield DMA. I also excluded KGAN in Cedar Rapids, IA because on August 1, 2002 another station in Cedar Rapids began providing services to KGAN under a JSA arrangement. Therefore, the revenue data for those stations is incomplete relative to the other stations in my dataset. However, including these stations in the statistical analysis has almost no effect on the results that I present below. I should also note that while I included WYZZ in Peoria, IL as a multiple station arrangement with WMBD, Sinclair is the licensee of WYZZ, but another party provides sales services to WYZZ. That party holds the license for WMBD, an independent station in Peoria.

23. *See* BIA FINANCIAL NETWORK, INC., TELEVISION MARKET REPORT, 2002 (BIA Financial Network, Inc. 2002).

24. *See* NIELSEN MEDIA RESEARCH, NIELSEN STATION INDEX, VIEWERS IN PROFILE (Nielsen Media Research, May 2002) (containing data on 2001 television households for each DMA).

25. *See* POLK MULTIDIMENSIONAL INTELLIGENCE, SDRS MEDIA SOLUTIONS (Polk, 2002 ed.) (containing data on percent of the DMA population of certain racial backgrounds).

TABLE 1. DATA SUMMARY FOR 58 SINCLAIR STATIONS

Variable	Mean	Standard Deviation	Minimum	Maximum
2001 Per-capita Income ($)	16,925.740	1,873.058	13,705	19,877
2001 Household Income ($)	44,162.570	4,803.546	35,134	52,974
2001 TV Households (000)	647.224	318.535	234	1,574
Proportion of Households that Subscribe to Cable 2001	0.696	0.063	0.57	0.85
Proportion African American 2001	0.132	0.098	0.004	0.349
Proportion Hispanic 2001	0.048	0.103	0.005	0.546
Proportion Asian 2001	0.016	0.013	0.003	0.09
Multiple Station	0.724	0.451	0	1
Multiple 'Big-4' Station	0.155	0.365	0	1

C. Econometric Results

I use the method of ordinary least squares, which minimizes the sum of the squared residuals in the regression equation, to estimate the total revenue function specified by Equation (1). I begin by estimating Equation (1) without including variables for Sinclair's provision of services to multiple stations in the DMA. In this regression I control for the level of economic activity within the DMA by including variables for per-capita income and the percent of cable subscribers. I also include racial variables to control for DMA characteristics that could affect retail sales within that DMA, and a dummy variable that indicates if the station is an affiliate of one of the "Big-4" networks—namely, ABC, CBS, NBC, or Fox. Presumably, those stations are more frequently viewed, on average, and would therefore command higher advertising revenues. Finally, I control for the number of viewers age 18 to 49 (Specification I) and ages 25 to 54 (Specification II) during the average viewer minute. These variables should be highly significant, both economically and statistically. Table 2 displays these regression results.

TABLE 2. LEAST SQUARE REGRESSION OF THE REVENUE EQUATION: DEPENDENT VARIABLE IS LOG OF REVENUES

	Specification I		*Specification II*	
Variable	**Coefficient**	**Robust T-Stat**	**Coefficient**	**Robust T-Stat**
Proportion of Cable Subs	3.268***	3.85	3.341***	3.90
Per-capita Income	1.107×10^{-4}***	3.66	1.146×10^{-4}***	3.54
Proportion African American	-0.017	-0.04	0.167	0.37
Proportion Hispanic	0.690*	1.81	1.049***	3.48
Proportion Asian	-0.369	-0.14	-3.978	-1.16
Big-4 Network	0.223**	2.39	0.134	1.34
Viewers Age 18 to 49	0.082***	10.30	----	----
Viewers Age 25 to 54	----	----	0.084***	9.58
Constant	10.235***	10.42	10.215***	9.95
Sample Size	58		58	
R^2	.83		.82	
F-Statistic (zero slopes)	33.99		36.87	

Note: ***Significant at 1% level; **Significant at 5% level; *Significant at 10% level.

The results in Table 2 indicate that 82 percent to 83 percent of the variation in revenues is explained by the covariates in the regression (depending upon the specification used). Therefore, the regression model fits the data well. In addition, the principal explanatory variables are both statistically and economically significant.[26] For example, the variable for the number of viewers is statistically significant in both regressions. The regression coefficient on the *Viewers* variable in Specification I indicates that an increase of 1,000 in the number of viewers between the ages of 18 and 49 will increase station revenues by 8.2 percentage points. This effect is virtually identical to the 8.4 percentage point increase in revenues that occurs when viewers between the ages of 25 and 54 increase by 1,000, as seen in Specification II. Expressed as elasticities, a one percent increase in the number of viewers between 18 and 49 increases revenues by 0.9 percent,

26. I use White-Huber standard errors to control for heteroskedasticity that I detected in the standard OLS regression. For the Specification I, a Cook-Weisberg test for heteroskedasticity yielded a p-value of 0.03, and for Specification II, a similar test rejected the null hypothesis of homoskedasticity at the 2 percent level of significance.

and a one percent increase in the number of viewers age 25 to 54 also increases revenues by 0.9 percent. A $1,000 increase in per-capita income increases revenues by between 11.1 and 11.5 percentage points. This means that a one percent increase per-capita income causes station advertising revenues to increase by 1.9 percent. Also, I find that advertising revenues rise as the share of the population within the DMA that subscribes to cable television increases,[27] and that Big-4 affiliates generate greater revenues than other stations for given audience size and demographics. Thus, I have obtained meaningful results from the basic regression model, and in the process have explained a large portion of the variation in revenues across Sinclair stations.

I now extend the analysis by including a dummy variable for Sinclair's provision of service to multiple stations in a DMA.[28] A positive and significant coefficient for that variable would be consistent with the theory that service provision to multiple stations within a DMA increases Sinclair's market power. Alternatively, a negative and significant coefficient is consistent with the theory that such service arrangements improve operating efficiencies,[29] thereby driving Sinclair's decisions to consolidate operations within certain DMAs. Table 3 provides these results.

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27. I also calculated the regressions without the *Proportion of Cable Subs* variable and obtained results very similar to those displayed in Table 2. All coefficient signs and significance levels remain the same with two exceptions. In Specification I, the *Proportion Asian* coefficient becomes positive but is still not significant at the 10 percent level when *Proportion of Cable Subs* was omitted. Also, in Specification I, the *Proportion Hispanic* coefficient becomes insignificant at the 10 percent level, but remains positive.

28. Again, I adjust the standard errors for heteroskedasticity, which I determine to be statistically significant in the standard least squares regression. In particular, a Cook-Weisberg test on Specification I in Table 3 run with the standard least squares technique shows heteroskedasticity at the 3 percent level of significance. That same number for Specification II is 2 percent.

29. Examples of such efficiencies would be a reduction in the average overhead costs of station operation or risk reduction from the ability to average advertising revenues across multiple stations within a market.

TABLE 3. LEAST SQUARE REGRESSION OF THE REVENUE EQUATION CONTROLLING FOR MULTIPLE STATION ARRANGEMENTS

	Specification I		*Specification II*	
Variable	**Coefficient**	**Robust T-Stat**	**Coefficient**	**Robust T-Stat**
Proportion of Cable Subs	3.424***	4.02	3.524***	4.14
Per-capita Income	1.038×10^{-4}***	3.42	1.063×10^{-4}***	3.33
Proportion African American	0.111	0.26	0.314	0.69
Proportion Hispanic	0.747*	1.96	1.116***	3.69
Proportion Asian	-1.440	-0.50	-5.295	-1.38
Big-4 Network	0.199**	2.22	0.104	1.13
Viewers Age 18 to 49	0.083***	10.79	----	----
Viewers Age 25 to 54	----	----	0.085***	10.02
Multiple Station	-0.158*	-1.70	-0.181*	-1.95
Constant	10.356***	10.96	10.357***	10.42
Sample Size	58		58	
R^2	.84		.83	
F-Statistic (zero slopes)	31.48		32.99	

Note: ***Significant at 1% level; **Significant at 5% level; *Significant at 10% level.

The estimated effect of Sinclair's provision of services through multiple stations in a DMA is reflected in the coefficient of the dummy variable, *Multiple Station,* which is equal to 1 if the station is located within a DMA where Sinclair provides service to more than one television station. As Table 3 shows, this coefficient is negative and statistically significant at the 10 percent level in both specifications.[30] Given this result, one must conclude that providing service to multiple stations within a DMA does not afford Sinclair additional market power with which to set the price for its advertising minutes. The negative sign for the *Multiple Station* variable in both specifications indicates that cost-cutting efficiencies, rather than an attempt to exert market power, were the principal motivation for Sinclair's provision of service to multiple

30. Residual plots reveal that station WDKA may be an outlier in the regressions in Table 3. When this observation is omitted from the sample, the changes in regression statistics are minimal. For example, when WDKA is omitted, the *Multiple Station* coefficient changes from -0.158 to -0.127 in Specification I and from -0.181 to -

stations within a DMA. Therefore, the Commission's arbitrary number of voices standard is overly restrictive from an economic standpoint, eliminating the opportunity for cost-reducing mergers or acquisitions that would cause local television advertising revenues to fall.[31]

In Table 4, I analyze the effect that service provision to multiple Big-4 network stations in a single DMA has on advertising revenues at those stations.[32] Once again, the variable reflecting Multiple Big-4 stations in a single DMA is a dummy variable that assumes a value of unity if Sinclair provides services through more than one such station and zero otherwise. This analysis is specifically relevant to the Commission's regulation that prohibits the provision of services to more than one of the top 4 rated stations within a DMA.

0.148 in Specification II. The robust t-stat for this coefficient changes from -1.70 to -1.44 in Specification I and from -1.95 to -1.71 in Specification II.

31. I also estimated the effect of the provision of service to multiple stations in a DMA on CPP. I included the effect of the number of television households, cable television usage, per-capita income, Big-4 network affiliation, and the racial makeup of the DMA as right-hand-side variables. I obtained meaningful results from that regression. Including a dummy variable for the provision of services to multiple stations within the DMA, showed that, within this sample, such an arrangement does not contribute to Sinclair's ability to raise advertising prices. In particular, the sign on the *Multiple Station* dummy variable was negative, and the coefficient was statistically insignificant.

I also estimated the regressions without the *Proportion of Cable Subs* variable and obtained results very similar to those displayed in Table 3. All changes in coefficient signs and significance levels are as follows: In Specification I, the *Multiple Station* coefficient changes from -0.158 to -0.085, and the robust t-stat changes from -1.70 to -0.81, making the coefficient insignificant at the 10 percent level. In Specification II, the *Multiple Station* coefficient changes from -0.181 to -0.104, and the robust t-stat changes from -1.95 to -0.95, making the coefficient insignificant at the 10 percent level. In addition, in Specification I, the *Proportion African American* coefficient becomes negative (and still insignificant), the *Proportion Hispanic* coefficient becomes insignificant (and still positive), the *Proportion Asian* coefficient becomes positive (and still insignificant), and the *Big4* coefficient becomes significant at the 10 percent level rather than the 5 percent level (and remains positive).

32. Again, I adjust the standard errors for heteroskedasticity, which I determine to be statistically significant in the standard least squares regression. In particular, a Cook-Weisberg test on Specification I in Table 4 run with the standard least squares technique shows heteroskedasticity at the 1 percent level of significance. That same number for Specification II is also 1 percent.

TABLE 4. LEAST SQUARE REGRESSION OF THE REVENUE EQUATION CONTROLLING FOR MULTIPLE BIG-4 NETWORK STATION ARRANGEMENTS

	Specification I		*Specification II*	
Variable	**Coefficient**	**Robust T-Stat**	**Coefficient**	**Robust T-Stat**
% Cable Subs	3.340***	3.94	3.436***	4.01
Per-capita Income	1.089×10^{-4}***	3.48	1.116×10^{-4}***	3.36
% African American	0.020	0.04	0.210	0.45
% Hispanic	0.613	1.47	0.953***	2.95
% Asian	-1.083	-0.40	-4.972	-1.39
Big-4 Network	0.276***	2.70	0.195*	1.86
Viewers Age 18 to 49	0.083***	10.61	----	----
Viewers Age 25 to 54	----	----	0.086***	10.05
Multiple Big-4 Station	-0.208	-1.63	-0.256*	-1.98
Constant	10.215***	10.30	10.197***	9.84
Sample Size	58		58	
R^2	.84		.84	
F-Statistic (zero slopes)	31.90		29.51	

Note: ***Significant at 1% level; **Significant at 5% level; *Significant at 10% level.

The results in Table 4 indicate that service provision to multiple Big-4-network stations in a single DMA has not, for the DMAs and stations I am able to study, increased Sinclair's market power. Rather, the coefficient on *Multiple Big-4 Station* is negative.[33] In Specification II, that coefficient is not only negative, but it is also statistically significant at the 10 percent level. The regression coefficient in Specification II indicates that for Big-4 stations in DMAs where Sinclair also provides service to another Big-4 station, advertising revenues are 0.3 percentage points *lower*.[34] This result gives further support to the hypothesis that improved operating

33. Residual plots reveal that station WDKA may be an outlier in the regressions in Table 4. When this observation is omitted from the sample, the changes in regression statistics are minimal. For example, in Specification I, when WDKA is omitted from the sample, the *Multiple Big-4 Station* coefficient changes from -0.208 to -0.203, and the robust t-stat for this coefficient changes from -1.63 to -1.71, indicating that the estimated decreased revenues is significant at the 10 percent level. In Specification II, the omission of WDKA causes the coefficient on *Multiple Big-4 Station* to change from -0.256 to -0.250, and the robust t-statistic becomes -2.10, indicating that the estimated decreased revenues is significant at the 5 percent level.

34. I also calculated the regressions without the *Proportion of Cable Subs* variable and obtained results very similar to those displayed in Table 4. All changes in coefficient signs and significance levels are as follows: In

efficiencies, and not increased market power, have motivated Sinclair to provide services to multiple stations within a DMA. If the Commission's regulations had been applied to these stations, then advertising prices would be *higher*, on average, than they are now. The FCC should carefully consider the economic consequences of maintaining its regulation that a single entity cannot operate multiple Big-4 stations in a single DMA. In particular, the evidence presented above indicates that the provision of service to more than one of those stations does *not* allow a service provider to increase its market power.[35]

IV. THE THEORY AND PRACTICE OF ANALYZING MARKET POWER FROM THE PROVISION OF SERVICES TO MULTIPLE BROADCAST TELEVISION STATIONS

The results of Section III suggest that the Commission's regulations of the operation of multiple local broadcast television stations are overly restrictive and not supported by economic analysis. Below, I discuss how a proper antitrust methodology, outlined by the DOJ's *Merger Guidelines*, analyzes market power.[36]

Specification I, the *Multiple Big-4 Station* coefficient changes from -0.208 to -0.168, and the robust t-stat changes from -1.63 to -1.16, making the coefficient insignificant at the 10 percent level. In Specification II, the *Multiple Big-4 Station* coefficient changes from -0.256 to -0.211, and the robust t-stat changes from -1.98 to -1.43, making the coefficient insignificant at the 10 percent level. In addition, in Specification I, the *Proportion African American* coefficient becomes negative (and still insignificant), the *Proportion Asian* coefficient becomes positive (and still insignificant), and the *Big4* coefficient becomes significant at the 5 percent level rather than the 1 percent level (and remains positive). In Specification II, the *Proportion Hispanic* coefficient becomes significant at the 5 percent level instead of the 1 percent level and remains positive, and the *Big4* coefficient becomes insignificant at the 10 percent level (and remains positive).

35. I also estimated the CPP regression specification with the inclusion of the *Multiple Big-4 Station* variable. These results have similar implications to those gleaned from the revenue specification that I estimated in Table 4. In particular, the coefficient on *Multiple Big-4 Station* was negative and statistically significant at the 90 percent level in regressions that used CPP for ages 25 to 54. In both regressions, the elasticity for that dummy variable was approximately –3, indicating that prices were 3 percent *lower* for stations where Sinclair provided services to multiple Big-4 stations in that DMA.

36. *See* UNITED STATES DEPARTMENT OF JUSTICE, HORIZONTAL MERGER GUIDELINES (April 2, 1992).

A. Market Definition

The first step in antitrust analysis is to define the relevant product and geographic markets. The relevant geographic market is defined by geographic boundaries, and the relevant product market is defined by the set of relevant products or services.[37] An antitrust market is the smallest market in which a hypothetical monopolist could profitably sustain a significant and nontransitory price increase.[38]

1. The Relevant Product Market

To define the relevant market for local television advertising, one must first determine the relevant product market. That is, one must determine the degree to which other forms of local advertising—namely, newspaper, radio, billboards, and direct mail—compete with local broadcast television for advertising dollars. Published economic research indicates that television is not its own antitrust market.[39] Also, my results above found that duopoly arrangements, even those among Big-4 Networks, did not result in market power—a result that would suggest that television broadcast with a DMA is not its own antitrust market. Recent research by C. Anthony Bush finds that local broadcast television is its own product market.[40] However, Bush's research cannot be fully evaluated on the basis of the information it provides to the reader. In particular, this paper is missing information that is standard in empirical economic research. Furthermore, one of Bush's variables appears to have been calculated in a manner that makes his results meaningless.

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37. *Id.* at § 1.1.
38. *Id.*
39. *See, e.g.,* Robert B. Ekelund, Jr., George S. Ford, & John D. Jackson, *Are Local TV Markets Separate Markets?,* 7 INT. J. ECON. BUSINESS 79, 92 (2000) (finding that other media compete with television for local advertising revenues).

Bush's paper does not contain a data summary table, the inclusion of which is a standard practice in econometric research. Such information allows the reader to determine if variables such as categorical variables or percentage variables have been correctly calculated. The average values, minimum values, and maximum values of variables help one to determine if those variables are consistent with reality, and if the data is therefore sound. Also, a data summary enhances one's ability to evaluate the regression results. For example, if a variable was constructed improperly and consequently had only slight variation, it would be difficult to find a statistically significant relationship between it and another variable, even if one existed in reality. A data summary table would allow a researcher to determine if statistically insignificant results were due to a truly insignificant relationship, or a dataset with questionable integrity.

The calculation of Bush's newspaper advertising expenditure variable is particularly questionable. To construct retail advertising newspaper expenditures for a DMA, Bush multiplies national retail expenditure for newspaper advertising by a scaling factor.[41] The scaling factor is calculated as the proportion of persons age sixteen or over who reside within that DMA.[42] Thus, Bush's estimated results for newspaper advertising do not reflect the true relationship between advertising prices and the intensity of newspaper advertising demand. Rather, they reflect the proportion of persons within a certain age group, relative to the entire nation, in a DMA.[43]

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40. C. ANTHONY BUSH, ON THE SUBSTITUTABILITY OF LOCAL NEWSPAPER, RADIO, AND TELEVISION ADVERTISING IN LOCAL BUSINESS SALES (Federal Communications Commission, Media Bureau Staff Research Paper, Sept. 2002) (finding low substitutability between television and other media for local business advertising).

41. *Id.* at 10-11.

42. *Id.* at 10-11, 13.

43. For example, suppose a researcher runs a regression of the data y_i on x_i and retrieves a regression parameter $\hat{a}$. If that researcher were to run another regression of y_i on $100*x_i$, that researcher would find that the regression parameter would be $100*\hat{a}$. In words, multiplying a variable by a constant does nothing to change the regression results. Rather, the regression parameter is prorated by that constant to account for the scaling affect it has on the data. *See, e.g.,* DAMODAR N. GUJARATI, BASIC ECONOMETRICS 161-62, (McGraw-Hill 3d ed. 1995) (discussing the scaling of a variable by a constant to simplify the units of measurement of a coefficient).

Hence, Bush's results are accurate *only* if his newspaper "allocation" factor *perfectly* predicts newspaper revenues, which is certainly not the case. Since Bush does not allow newspaper advertising per person to vary across DMAs, he cannot test for the effect of newspaper advertising on the price of television advertising. Therefore, Bush's results cannot be used to gauge the intensity of competition between the different forms of advertising media.

2. The Relevant Geographic Market

In addition to the relevant product market, the relevant geographic market must also be considered. According to the *Merger Guidelines,* the relevant geographic market is the *smallest* market in which a hypothetical monopolist could increase price by a significant amount for a sustainable period of time.[44]

The Commission's current ownership rules assert that stations compete with one another if they operate within a common DMA *and* if their Grade B Contours overlap.[45] Thus, according to the Commission, location within a single DMA is a necessary, but not a sufficient condition for two television stations to be competitors. While it would seem rational that two stations whose contours overlap will serve a certain number of common viewers and advertisers and would therefore be competitors, requiring that those stations reside within a single DMA may be too restrictive. For example, the FCC's rules do not consider stations broadcasting from the Washington D.C. DMA and the Baltimore, MD DMA to be competitors. However, the large population that resides in the suburbs between Washington, D.C. and Baltimore can receive signals from broadcasters in both DMAs. If a broadcaster in Baltimore were to increase the price of a thirty-second advertising slot, it would risk loosing advertising revenues to Washington D.C.

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44. *See* MERGER GUIDELINES, *supra* note 36, at § 1.2.

stations whose Grade B contours reach the D.C./Baltimore suburbs. Hence, the Commission's geographic market definition (as applied to the Washington, D.C. and Baltimore DMAs) could be in conflict with the definition set forth in the *Merger Guidelines.* The Commission should therefore attempt to determine if certain stations located in *adjacent* DMAs compete with one another, or if location within a common DMA is indeed a necessary condition for stations to be deemed competitors.

B. Market Concentration

After the relevant market has been defined, one must then assess the (anti-) competitive effect of a combination of two or more sellers. In the case of a merger, the potential consumer harm derives from the ability of the merged parties to raise price after the merger. The Herfindahl-Hirschman Index (HHI) of market concentration is one of the primary tools used by the DOJ to gauge the effect of a merger, but it does not generally provide dispositive results.[46] Based on the HHI before the proposed merger, the industry is classified as competitive, moderately concentrated, or highly concentrated.[47] Proposed mergers in competitive markets are usually allowed to proceed without further scrutiny.[48] In moderate or highly concentrated industries, however, the *Merger Guidelines* maintain that further scrutiny is warranted if the HHI would increase above a certain level as a result of the merger or acquisition.[49]

C. A Sustainable Increase in Market Price, Post-Merger

If a broad analysis (such as the HHI method described above for the relevant product and geographic market) indicates that a proposed merger has the potential to cause consumer harm, a

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45. *See* 2002 Biennial Review, *supra* note 1, at ¶ 6 (stating that ownership of two stations within a DMA is allowed, and presumable not anti-competitive, if the Grade B Contours do not overlap).

46. *See* MERGER GUIDLINES, *supra* note 36, at § 1.5.

47. *Id.*

more substantial analysis is warranted. In particular, it is necessary to determine if the merger would cause a significant and nontransitory increase in market price. That is, it is necessary to determine whether the increased market power of the combined firm would outweigh any downward pressure on prices that cost-reducing efficiencies of the merger might produce. On the other hand, if the HHI threshold is not reached, the Commission may conclude that further analysis is not required. My results in this paper suggest that the product market may be fairly broad and that multiple station operations do not necessarily increase market power.

CONCLUSION

The FCC's approval process for the ownership and operation of multiple broadcast stations by a single entity is not justified by economic analysis. To determine if the FCC's process is consistent with the economic theory of market power, I performed an econometric analysis of the effect of the ownership or the provision of service through multiple television stations, or multiple Big-4-network affiliates, within a DMA on a station's local advertising revenues. The results of my analysis indicate that local broadcast advertising revenues are not significantly higher for stations where a specific entity owns or provides services through two stations. Because, within my sample, such arrangements do not lead to higher advertising rates, the Commission should rethink this element of its station ownership rules. In addition, statistical evidence shows that the Commission's regulation of the provision of service to multiple Big-4 stations within a DMA is overly stringent. In particular, the provision of service to two of the

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48. *Id.*
49. *Id.*

Top-4 stations within a DMA resulted in lower prices for advertising minutes in my sample and has led to station revenues that are 0.3 percent *lower*, a difference that is statistically significant.

The FCC should, as part of its Biennial Review, amend its ownership rules for local broadcast stations. Instead of its current mechanistic "duopoly" standard, the FCC should mandate an analysis of consumer welfare in the relevant market. By doing this, the FCC can oppose those arrangements that would cause economic harm to consumers by harming parties that purchase advertising from broadcasters, while at the same time allowing consolidation arrangements that would take advantage of improved operating efficiencies.

APPENDIX I. SINCLAIR DMAS AND SERVICE PROVISION WITHIN SINCLAIR DMAS

DMA	Number of Stations To Which Sinclair Provides Service
Asheville	2
Baltimore	2
Birmingham/Tuscaloosa	2
Buffalo	2
Cape Girardeau	2
Charleston, SC	2
Charleston/Huntington, WV	2
Cincinnati	1
Columbus	2
Dayton	2
Des Moines	1
Flint	1
Greensboro-Winston-Salem	2
Kansas City	1
Las Vegas	2
Lexington	1
Madison	1
Milwaukee	2
Minneapolis	1
Nashville	2
Norfolk	1
Oklahoma City	2
Pensacola	1
Peoria	2
Pittsburgh	2
Portland	1
Raleigh	2
Richmond	1
Rochester	1
Sacramento	1
San Antonio	2
Springfield, IL	1
Springfield, MA	1
St. Louis	1
Syracuse	2
Tallahassee	2
Tampa	1
Tri-Cities	1

Note: In Springfield, IL, WICS and WICD are both NBC affiliates, and WICS is a satellite of WICS; I therefore treat them as one station. I exclude WFGX in the Pensacola DMA from the analysis because it is a very small independent station with no reported ratings. I also excluded KGAN in Cedar Rapids, IA because beginning on August 1, 2002 another station in Cedar Rapids began providing services to KGAN under a JSA arrangement. In Peoria, another company, not Sinclair, provides services to the two stations in the dataset.

APPENDIX II. STATIONS, AFFILIATION, AND STATUS IN DMAS WHERE SINCLAIR HAS MULTIPLE STATION ARRANGEMENTS

DMA	Station-Affiliation (Status)	Station-Affiliation (Status)
Asheville	WLOS-ABC (O&O)	WBSC-WB (LMA)
Baltimore	WBFF-Fox (O&O)	WNUV-WB (LMA)
Birmingham/Tuscaloosa	WTTO-WB (O&O)	WABM-UPN (O&O)
Buffalo	WUTV-Fox (O&O)	WNYO-WB (O&O)
Cape Girardeau	KBSI-Fox (O&O)	WDKA-WB (LMA)
Charleston, SC	WMMP-UPN (O&O)	WTAT-Fox (LMA)
Charleston/Huntington, WV	WCHS-ABC (O&O)	WVAH-Fox (LMA)
Columbus	WSYX-ABC (O&O)	WTTE-Fox (LMA)
Dayton	WKEF-NBC (O&O)	WRGT-Fox (LMA)
Greensboro-Winston-Salem	WXLV-ABC (O&O)	WUPN-UNP (O&O)
Las Vegas	KVWB-WB (O&O)	KFBT-Ind. (O&O)
Milwaukee	WCGV-UPN (O&O)	WVTV-WB (O&O)
Nashville	WZTV-Fox (O&O)	WUXP-UPN (O&O)
Oklahoma City	KOCB-WB (O&O)	KOKH-Fox (O&O)
Peoria[a]	WYZZ-Fox (OSA)	WMBD-Ind (O&O)
Pittsburgh	WPGH-Fox (O&O)	WCWB-WB (O&O
Raleigh	WLFL-WB (O&O)	WRDC-UPN (O&O)
San Antonio	KABB-Fox (O&O)	KRRT-WB (O&O)
Syracuse	WSYT-Fox (O&O)	WNYS-WB (LMA)
Tallahassee	WTWC-NBC (O&O)	WTXL-ABC (JSA)

Note: A company other than Sinclair has a multiple station arrangement in Peoria. In particular, Sinclair is the license holder for WYZZ and another company provides services to WYZZ under a JSA arrangement. That other company also provides services to WMBD. Because Sinclair was able to provide me with financial data on both WYZZ and WMBD, I included those stations in my analysis.

APPENDIX III. THE PROFIT MAXIMIZATION PROBLEM, AND MARKET POWER

In the long-term, a service provider can choose to increase or decrease the quantity of advertising it offers in response to changes in the demand for its advertising. It can change the format of its programming or offer paid programming in late night slots to accommodate such demand changes. In the short-term, however, the quantity of advertising that the broadcaster can offer is more rigid. As a result, the incremental costs of operating are different in short-term than in the long-term. I begin by presenting a model of long-term profit maximization, and then modify that model to accommodate conditions that would be unique to the short-run setting.

The rational broadcaster will choose the price for its advertising that maximizes profits, Π, according to the following optimization problem:

$$\underset{\{p \geq 0\}}{Max}\ \Pi = q(p,o) * p - c(q(p,o))$$

The variable q is the number of viewer minutes of advertising, and p is the price per viewer minute. The cost function is $c(.)$, which is increasing in the number of viewer minutes offered. Finally, o, is the ownership of multiple stations in the relevant market, which we assume to be fixed for now. Differentiating the profit function with respect to p yields the first order condition given by (A.1)

$$(A.1) \quad q + p * \frac{\partial q}{\partial p} - \frac{\partial c}{\partial q} * \frac{\partial q}{\partial p} = 0.$$

Rearranging terms, and dividing both sides of the equation by p yields the Lerner Index[50] of market (monopoly) power, which equals the inverse of the own-price demand elasticity:

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50. *See* Abba Ptachya Lerner, *supra* note 18, at 157-75.

$$\text{(A.2)} \quad \frac{p - \frac{\partial c}{\partial q}}{p} = -\frac{1}{\eta}$$

Equation (A.2) states that the more inelastic is the demand for a particular station owner's advertising minutes, the greater that broadcaster's ability will be to price above the marginal cost of another viewer minute of advertising. If the provision of service to multiple stations or multiple Big-4 stations in a DMA (signified by an increase in the variable *o*) leads to market power, one would view that market power as a relatively inelastic demand curve for advertising revenues for those stations.

In the short-term, incremental costs are negligible. Thus, equation (A.2) reduces to $\eta = -1$. In words, the profit maximizer is now a revenue maximizer, and will set price where demand has unitary elasticity. If an increase in the variable *o* were to cause demand to become less elastic for any given quantity of advertising, demand would then be *inelastic* (i.e. closer to 0) at the service provider's former equilibrium. Furthermore, the old level of revenues that were once optimal would now be less than optimal. The service provider would increase price until $\eta = -1$ held, and would then be operating under a higher level of advertising revenues than before. Thus, if one were to formulate a hypothesis that was applicable to short-run data, one would test whether or not the provision of service to multiple stations within an area results in higher advertising revenues, which I found not to be true when applied to Sinclair's advertising data.

APPENDIX IV. QUALIFICATIONS

My name is Robert W. Crandall. I am a Senior Fellow in Economic Studies at the Brookings Institution, a position that I have held since 1978. Additionally, I am chairman of Criterion Economics in Washington, D.C. My areas of economic research are antitrust, telecommunications, the automobile industry, competitiveness, deregulation, environmental policy, industrial organization, industrial policy, mergers, regulation, and the steel industry.

I have written widely on telecommunications policy, the economics of broadcasting, and the economics of cable television. I am the author or co-author of five books on communications policy published by the Brookings Institution since 1989.[51] In addition, I have published four other books on regulation and industrial organization with the Brookings Institution.[52] My scholarship has been cited on numerous occasions by the federal judiciary and the Federal Communications Commission (FCC).

I have been a consultant on regulatory and antitrust matters to the Antitrust Division of the U.S. Department of Justice, to the Federal Trade Commission, to the Canadian Competition Bureau, and to numerous companies in the telecommunications, cable television, broadcasting, newspaper publishing, automobile, and steel industries. I have also been a consultant to the

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51. ROBERT W. CRANDALL & LEONARD WAVERMAN, WHO PAYS FOR UNIVERSAL SERVICE? WHEN TELEPHONE SUBSIDIES BECOME TRANSPARENT (Brookings Institution 2000); ROBERT W. CRANDALL & LEONARD WAVERMAN, TALK IS CHEAP: THE PROMISE OF REGULATORY REFORM IN NORTH AMERICAN TELECOMMUNICATIONS (Brookings Institution 1996); ROBERT W. CRANDALL & HAROLD FURCHTGOTT-ROTH, CABLE TV: REGULATION OR COMPETITION? (Brookings Institution 1996); ROBERT W. CRANDALL, AFTER THE BREAKUP: U.S. TELECOMMUNICATIONS IN A MORE COMPETITIVE ERA (Brookings Institution 1991); ROBERT W. CRANDALL & KENNETH FLAMM, CHANGING THE RULES: TECHNOLOGICAL CHANGE, INTERNATIONAL COMPETITION, AND REGULATION IN COMMUNICATIONS (Brookings Institution 1989).

52. ROBERT W. CRANDALL & PIETRO S. NIVOLA, THE EXTRA MILE: RETHINKING ENERGY POLICY FOR AUTOMOTIVE TRANSPORTATION (Brookings Institution 1995); ROBERT W. CRANDALL, MANUFACTURING ON THE MOVE (Brookings Institution 1993); ROBERT W. CRANDALL & DONALD F. BARNETT, UP FROM ASHES: THE U.S. MINIMILL STEEL INDUSTRY (Brookings Institution 1986); ROBERT W. CRANDALL, HOWARD K. GRUENSPECHT, THEODORE E. KEELER & LESTER B. LAVE, REGULATING THE AUTOMOBILE (Brookings Institution 1986).

Environmental Protection Agency and the U.S. Department of the Treasury.

I was an Assistant Professor and Associate Professor of Economics at the Massachusetts Institute of Technology between 1966 and 1974. I also taught at George Washington University. I have twice served in the federal government. I was Acting Director, Deputy Director, and Assistant Director of the Council on Wage and Price Stability in the Executive Office of the President. In 1974-75, I was an adviser to Commissioner Glen O. Robinson of the FCC. I received an A.B. (1962) from the University of Cincinnati and a Ph.D. in Economics (1968) from Northwestern University.